6440
02E:HRS:hrs
20 November 92

MEMORANDUM

From: Mobility and Contingency Planning, NEHC Code 02E
To: CDR Joe Wassell, CINCFOR, ATTN: FCMD-JT, Fort McPherson, GA 30330-6000

Subj: PREVENTIVE MEDICINE INFORMATION CONCERNING HURRICANE ANDREW

Encl: (1) Hurricane Andrew After Action Report from DVECC Jacksonville
(2) Hurricane Andrew After Action Report from NEPMU-2, Norfolk

1. Enjoyed your informative presentation at the CINCLANTFLT meeting. It has really gotten my mind to working about how we can better coordinate the medical forces that descend on the disaster area. I am working on a mission capability statement for our subordinate commands, like the DVECCs, which I will send to you when complete. I like the idea of doing initial damage and medical assessments so that a better plan can be formulated on what to send. CINCLANT has a Disaster Assessment Survey Team (DAST) concept that works along these same lines.

2. Enclosures (1) and (2) are for your information. I liked LCDR Need's comments about the Navy having the greatest flexibility and potential for helping. We can task organize our work and we are small enough that we can do it quickly. The disadvantage is that we are small scale, so assessments are about as far as we can go without other help.

3. Again, thank-you for coming to Norfolk. You broadened my horizons regarding planning agents and what they do.

H. R. STEVENSON

Encl (6)

FOR INFORMATION ONLY

NEHC- 02

DEPARTMENT OF THE NAVY

NAVY DISEASE VECTOR ECOLOGY AND CONTROL CENTER
NAVAL AIR STATION
JACKSONVILLE, FLORIDA 32212-0043

6250
01/227502
1 OCT 1992

FIRST ENDORSEMENT on LCDR Need's ltr 6250 01/227501 of 1 Oct 92

From: Officer in Charge, Navy Disease Vector Ecology and Control Center, Jacksonville
To: Commanding Officer, Navy Environmental Health Center

Subj: HURRICANE ANDREW AFTER ACTION REPORT

1. Forwarded.

2. My thanks and congratulations have gone out to the Navy Preventive Medicine Detachment for their outstanding efforts in the wake of Hurricane Andrew. From these endeavors we have gained invaluable experience and insight.

M T Wooster
M.T. WOOSTER

Copy to: (w/encl)
NAVENPVNTMEDU TWO

6250
01
1 Oct 92

From: LCDR James T. Need, MSC, USN
To: Commanding Officer, Navy Environmental Health Center
Via: Officer in Charge, Navy Disease Vector Ecology and Control Center, Jacksonville

Subj: HURRICANE ANDREW AFTER ACTION REPORT

Encl: (1) NAVENVIRHLTHCEN Personnel Assisting in Hurricane Andrew Relief Efforts
(2) Commands/Personnel Assisted
(3) Plan of Attack/Relief Efforts Accomplished
(4) Lessons Learned

1. Executive Summary. Four days following Hurricane Andrew, this Center received a request from CAPT Richard Gorham, U.S. Public Health Service (USPHS) Hurricane Andrew-Preventive Medicine Task Force Leader, to provide preventive medicine/vector control assistance. Three days later, an assessment team consisting of one medical entomologist, one epidemiologist, and two preventive medicine technicians (PMTs) was dispatched to Dade County, Florida. Two additional vector control teams consisting of four medical entomologists, three PMTs, and related vector control equipment were also sent during the ensuing four days (see enclosure (1)). The area of most severe destruction covered more than 100 square miles, included many medium-sized cities and an entire air force base (Homestead), and damage was estimated at more than 20 billion dollars. At least 150,000 homes were badly damaged (50 percent of those were totally destroyed), and more than 250,000 persons were left homeless. Once in the area, the three teams coalesced into one Navy preventive medicine detachment (PMD) with the following goals: to evaluate needs in the storm-stricken area, establish points of contact, and render all necessary assistance to on-site USPHS and local authorities. Relief efforts included establishing a county-wide CO_2-trap mosquito surveillance program, providing mosquito and fly control support to more than 25 separate commands/civilian groups, and furnishing administrative support in the tracking of shipments of donated insect repellent and rodenticides. Seventeen days later, the PMD returned home having marked two other significant milestones: the largest single deployment of the Navy Disease Vector Ecology and Control Center, Jacksonville (NAVDISVECTECOL-CONCEN JAX) personnel in a relief effort and the first time U.S. Navy assets and the USPHS had served together within a single command structure since the Second World War.

2. Enclosure (2) lists the individual civilian and military groups assisted. Enclosure (3) gives an indication of the type

of relief efforts provided by the PMD. Enclosure (4) discusses lessons learned, hopefully providing thought for future planning purposes.

3. As a result of the outstanding working relationship developed between the USPHS and NAVDISVECTECOLCONCEN JAX during this operation, this Center has been asked to participate in a Federal Emergency Management Agency - Hurricane Andrew After-Action Conference, in the Washington, D.C., area 8-11 November 1992. One of the discussion issues to be brought up by the USPHS is the possibility of establishing a memorandum of agreement between the Navy Medical Department and the USPHS for future relief operations and related training.

4. I thank all the team members for their many long hours of work, their eagerness to provide support, and their constructive and thought-provoking after-action comments.

5. In closing, two comments should be considered:

a. Of all of the preventive medicine assets assisting in these efforts, the U.S. Navy had the greatest flexibility and potential for helping. The reason is simple: we can task organize our support, and we can do it quickly and effectively.

b. Finally, for situations such as Hurricane Andrew, doctrine at the Federal, Department of Defense, and Bureau of Medicine and Surgery levels must provide a well-conceived, operational plan that clearly establishes who is in charge as well as a timeline for action. If such a plan already exists, the players should be informed.

Very Respectfully,

J. T. NEED

NAVENVIRHLTHCEN Personnel Assisting in Hurricane Andrew Relief Efforts

NAME	ARRIVAL DATE	DEPARTURE DATE
1. CDR Donald Herip, MC, USN	31 August	09 September
2. LCDR Manuel Lluberas, MSC, USN	31 August	12 September
3. HM2 Paul E. Klimkowski, USN	31 August	12 September
4. HM2 Steve Roman, USN	31 August	05 September
5. LT David Lavender, MSC, USNR	02 September	14 September
6. LT Michael D. Zyzak, MSC, USNR	02 September	12 September
7. HM1 John J. Roarty, Jr., USN	02 September	17 September
8. HM1(SW) David N. Wolfert, USN	02 September	14 September
9. LCDR James T. Need, MSC, USN	04 September	17 September
10. LCDR Thomas Breaud, MSC, USN	04 September	17 September
11. HM1 Daniel M. Spafford, USN	04 September	17 September
12. LCDR Slaten, MC, USN	11 September	25 September

Encl (1)

Commands/Personnel Assisted by the Navy Preventive Medicine Detachment-Hurricane Andrew

10th Mountain Brigade, U.S. Army
2nd Medical Battalion, 2nd FSSG, Camp Lejeune, NC
2nd Marine Expeditionary Force (Medical), Camp Lejeune, NC
31st Medical Group, USAF, Homestead Air Force Base
41st Engineering Battalion, U.S. Army
43rd Engineering Battalion, U.S. Army
519th Military Police Brigade, U.S. Army
82nd Airborne Division, FT Bragg, NC
907th Aerial Spray Group, Ohio Air National Guard
American Red Cross
Centers for Disease Control, Atlanta, GA
Citizens of South Dade County, FL, Dade County Fire Department
Dade County Mosquito Control District
Dade County SWAT Team
Dade County Waste Water Treatment Center
Defense Commissary Agency (DECA)
EPICON
Federal Emergency Management Agency
Florida Air National Guard, Homestead, FL
Homestead Air Force Base, FL
Human Rehabilitative Services, Dade County and State of Florida
Miccosukee Indian Nation
National Disaster Management Service
Navy Construction Battalion 410
Navy Construction Battalion 420
Navy Security Group Activity, Homestead, FL

Plan of Attack/Relief Efforts Accomplished:

1. Prior to deployment, the primary entomological problems expected in the devastated area were filth flies (due to the vast amounts of decaying carcasses, rotting garbage and food), and mosquitoes. Culex nigripalpus (vector of St. Louis Encephalitis (SLE)) and Aedes taeniorhynchus (pest mosquito) were the primary mosquito species with which to be concerned. Rodent problems were expected to develop months later but were not an immediate concern. Furthermore, trapping/baiting was not deemed possible until after significant cleanup had occurred, eliminating bait competition problems.

2. Based on our general knowledge of the area and conversations with mosquito control personnel from counties surrounding Dade County, no disease vector potential was thought to exist. SLE was a concern, but activity in the area, historically, is minimal and the overall activity for Florida this year had been very low. The potential for malaria and dengue, however slight, could not be completely ruled out, as a large population of undocumented immigrants was known to live and work in the migrant camps in south Dade county. Since significant fixed-wing assets existed in Dade county and other nearby counties, and we expected the U.S. Air Force (USAF) spray team to be called in the event that large areas needed spraying, we decided to concentrate our efforts at control using ground equipment.

3. With those missions in mind, the vector control teams deployed outfitted with a truck-mounted ULV machine, two hydraulic sprayers, two hand-held ULVs, two back-pack sprayers, safety and spill kit materials, ten gallons of Scourge® pesticide, two cases of Demon® wettable powder, and various types of larvicides. One of the hydraulic sprayers was modified before departure to permit attachment of several B&G spray wands, permitting rapid treatment of large numbers of tents. Thanks to the efforts of the Naval Facilities Engineering Command, Southern Division (Mr. Bill Bennett), and Pascoe County, Florida, other insecticides and equipment (Buffalo Turbine, several ULV machines, etc.) were known to be in the local area and were made accessible to us.

4. Remarkably, filth flies never became more than a minor nuisance during the deployment. The only apparent explanation may have been the overall wet conditions that made potential breeding sites unsuitable. Green bottle flies were initially very numerous, but as breeding sites decreased so did their numbers. The anticipated need to treat hundreds of tents in the tent cities for refugee housing never developed.

5. Due to the expansive area of destruction and the fact that we were assigned to the USPHS as one part of an overall preventive

medicine task force (and we were late getting on the scene), it was difficult at first to determine our exact mission. Aerial mosquito spraying appeared to be under the direction of Centers for Disease Control (CDC) and the USAF. The 82nd Airborne had arrived with two LX teams consisting of more than 50 personnel, apparently able to care for their own troops as well as assist the local populace. The Marine Corps tent cities had organic preventive medicine personnel to cover the vast majority of their entomological concerns.

6. The Navy Disease Vector Ecology and Control Center, Jacksonville (NAVDISVECTECOLCONCEN JAX), assessment team quickly evaluated the situation and noted that no one else could provide mosquito surveillance on a regional basis. This was very much needed and a nightly mosquito surveillance program using CO_2-baited traps and covering all of Dade County was initiated the day of arrival. The information furnished was critical to proper utilization of the Air Force's aerial spray team and provided the only effective measure of the overall mosquito situation in the area. This information was utilized daily by both state of Florida officials and the CDC. In addition, captured Cx. nigripalpus mosquitoes were forwarded to the CDC for SLE virus surveillance. Upon detachment, the PMD left mosquito surveillance equipment with Dade County personnel.

7. The other task unique to our unit was the ability to handle trouble calls. As entomological problems arose and were called in to the Preventive Medicine Task Force, NAVDISVECTECOLCONCEN JAX became the unit to which the calls were referred. The following are a few examples of the types of calls received and addressed:

a. Larval mosquito surveillance: the potential existed for having to survey more than 1,000 damaged swimming pools in the region. Our preliminary monitoring efforts showed that pools would not be significant mosquito breeding areas, saving considerable expense and manpower that were much needed in other relief work.

b. Adult mosquito control was provided on numerous occasions to the Everglades migrant worker camp, Dade County waste water treatment facility, the 82nd Airborne, and 10th Mountain Brigade Army units, Naval Security Group Activity at Homestead, Marine Corp tent cities, as well as other units.

c. Numerous consults with U.S. Army and U.S. Air Force preventive medicine personnel on a daily basis.

d. Several days were spent in entomological support of cleanup of the DECA commissary at Homestead AFB as well as many food service areas on base. These areas had not received

electrical power in more than two weeks and contained very large quantities of rotting food products. In addition, more than 25 dumpsters were sprayed for fly control.

e. Direct administrative support was supplied daily to assist CAPT Gorham, the preventive medicine task force leader. This involved acting as liaison between the different services as well as with state and other federal officials.

LESSONS LEARNED:

Big Picture

A. If a Federal plan for handling medical problems related to an emergency of this scale existed prior to Hurricane Andrew, then it was not evident to those on the scene. If an operational plan does not exist that clearly sets a chain of command among Federal, State, private relief efforts, and DOD assets and establishes a timeline delineating the time at which certain relief experts should be on-site, then it must be developed.

B. While preventive medicine issues are very important in disaster relief, they are but one of many that must be considered, each at its proper time; public affairs, emergency services (fire, rescue, evacuation), hospital associations (geriatrics, ACLS, nursing), animals (dead and living), water, food, electricity, solid/liquid waste, mental health, epidemiology, pharmaceuticals, authority within refugee camps, debris removal, relief material storage/inventory/distribution, volunteer coordination and distribution, transportation, dental, medical logistics, command and control, communications.... A logical progression of problems can be anticipated starting with acute trauma care and communications problems on day one, followed by preventive medicine problems 7-10 days later, etc. Mistakes such as contracting solid/liquid waste removal on a 2-3xs per week basis to a number of smaller businesses should never be made again. Daily pickup by the largest, most capable company should be a standard contract item. While every contingency cannot be planned for, there are certain problems common to every disaster that can and should be considered.

C. If U.S. Navy medical assets are to be utilized properly in future relief efforts, authority to organize and deploy task-oriented teams such as those specializing in preventive medicine assessment should reside at the level at which the relief will be provided. The Navy Environmental Health Center should have the authority to organize and deploy assessment teams followed by "action" teams as determined by initial assessment. Waiting for BUMED permission causes undue hardship, puts relief efforts behind the power curve, and leaves the Navy sitting on the sidelines. Finally, the Navy preventive medicine community needs to educate the operational plans people (J-3/G-3) as to our ability and capacity to assist in future disasters. It seemed as if no one but the USPHS knew who we were or what we could do.

Smaller Picture:

A. Echelon 4 units should prepare schematic pre-disaster plans and conduct periodic training related to relief efforts. (NAVDISVECTECOLCONCEN Jax is presently developing a 1-2 day course titled "Vector Control Issues in the Wake of a Natural

Disaster" based on recent experiences.) Pre-assigned assessment teams should be ready to go within 48 hours of a major disaster.

B. Depending on the scope of the disaster, preventive medicine assessment teams should consist of an environmental health officer, an epidemiologist and a medical entomologist as well as 1-2 preventive medicine technicians. The team can be task-oriented to fit the specific scenario. If the disaster is of a grand scale, plan to utilize one of the officers as a staff officer in liaison with USPHS and other DOD/JTF personnel. When and if additional personnel (e.g., a vector control team) are added to the assessment team, the senior person in the initial team should continue to lead the "reinforced" team. The decision to task organize and send additional teams or equipment must rely heavily on the findings and recommendations of the assessment team.

C. A suggested protocol for action during the first few days would include the following items: assign assessment and follow-on teams, begin equipment checklist review, develop points of contact <u>before</u> entering the area, start thinking about required transportation, <u>and</u> get maps of the area at the first sign of a possible deployment. Maps of the Miami area could not be found any-where in the Jacksonville, Florida, area 5-7 days after the storm struck. AAA now uses on-line services for providing maps to customers. NAPMIS and echelon 4 commands should investigate this and other ways of obtaining maps immediately.

D. In today's world, communication is vital to success. With that in mind, it is suggested that a modification of the technical support MMART block be developed and purchased. The following items should be included: two cellular phones (one for the forward headquarters and one for the road), a notebook computer (Zenith 486), portable printer, a fax machine and related supplies. These are not "nice to have" items, but absolutely necessary to carry out the mission in an effective manner. Experience in this deployment, Operation Gitmo, and Operation Desert Storm have proven this.

E. Use NAVFACENGCOM for information regarding vector control equipment in the affected area. Such information proved extremely valuable as we were able to utilize a new pest control shop at NAVSECGRUACT Homestead as our base of operations. We also had (faxed to us prior to deployment) a list of all equipment and pesticides on hand and permission to use same.

F. While pesticide resistance information is generally considered important for Out-Conus operations, it is also important for In-Conus. For example, malathion is not an acceptable pesticide for use in much of Florida.

G. Utilize local mosquito control personnel. They know the area, know the problems, and can save much time. Establish contact as early as possible in the planning process.

H. In recent years a great effort has been made to obtain medical information (vectors, disease threat, etc.) for operations outside the United States; very little information was readily available for the Miami area. More attention needs to be directed to gathering this type of data for high risk areas of the United States, such as Oakland, California, Houston, Texas, and Charleston, South Carolina. Special attention should be given to areas with transient populations of foreign nationals.

I. Vehicles - How preventive medicine units will react next time must be considered. NAVDISVECTECOLCONCEN JAX utilized four vehicles at basically no cost, to react to this emergency. Under the new vehicle leasing program now in effect in our area, this would have cost at least $1,000 a week, assuming vehicles could have been obtained and the Public Works Center would have permitted taking them 400 miles away.

J. The role played by NAVDISVECTECOLCONCEN JAX in mosquito surveillance should not be underplayed. No other group, whether it was U.S. Army, CDC, or state of Florida, had our ability to set up and run such a system. In fact, the U.S. Air Force could not have effectively carried out their aerial spray mission without our support. The surveillance data provided vital information, was utilized by many different commands/agencies, and should receive higher prioritization in disaster relief planning and training programs.

FOR INFORMATION ONLY

NEHC- 02

DEPARTMENT OF THE NAVY
NAVY ENVIRONMENTAL AND PREVENTIVE
MEDICINE UNIT NO.2
NORFOLK, VIRGINIA 23511-6288

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From: Officer in Charge, Navy Environmental and Preventive Medicine Unit No. 2
To: Commanding Officer, ATTN: Code (02B), Navy Environmental Health Center

Subj: AFTER ACTION REPORT - HURRICANE ANDREW

Encl: (1) National Disaster Medical System Concept of Operations
(2) Environmental Health Team Status Report
(3) ARC Disaster Shelter Registration
(4) Harris Field (Tent City I) Age Distribution by 5 Year Intervals by Sex
(5) Daily Medical Surveillance Summary Form

Not included

BACKGROUND:

Upon the arrival to southern Florida of the U.S. Public Health Service, its NDMS (National Disaster Medical System - see enclosure (1)) DMATs (Disaster Medical Assistance Teams), and the introduction of other uniformed services, the need for a community coordinated health support and relief effort became critical. A HEALTH TASK FORCE was established around members of community organizations, federal agencies, and the uniformed services. The purpose of the Task Force was to generate a full and complete assessment of critical functional areas affecting the reestablishment of viable health care delivery systems in hurricane-affected areas. The functional areas are: Evacuation, Treatment, Hospital Facilities, Preventive Medicine, Veterinary Support, Dental Support, Mental Health, Medical Logistics, Health Care Infrastructure (state and local) and Communications. Each of the functional areas is assessed, and an ongoing evaluation is conducted using a three color system. Red - little or no local capability, significant DoD assistance required. Amber - some capability (50-75%) some DoD assistance required. Green - near full pre-hurricane capability, no further DoD assistance required.

INTRODUCTION:

Physician epidemiologists from NEPMU2 mobilized to Dade County in conjunction with DVECC JAX personnel starting 31 Aug 92. This report reflects the status of selected Task Force recovery efforts through 24 Sep 92. On Hurricane Day H+30 an amazing amount of recovery and return to normal living had occurred, although the impact of the hurricane was staggering; of the approximately 400,000 persons living in the census tract hardest hit, an estimated 283,000 remained.

Restoration of electrical power is proceeding ahead of schedule. Florida Light and Power has surveyed the entire disaster area. Service has been restored in 94% of South Dade County. Full power to the Homestead and Florida City should be available by 07 October. Schools were opened on 14 Sep.

Overall, most aspects of the operation have completed the emergency phase and are now in the transition phase from military to local control. In some cases this has already been accomplished. Emergency medical service has now been resumed by Metro-Dade Fire and Rescue. All vector control has been contracted to PRISM Integrated Sanitation Management with the exception of mosquito control which will be taken over by the Dade County Mosquito Control. Florida Health and Rehabilitative Services (HRS) is assuming environmental health responsibilities. On 12 Sep all functional areas were amber. As of 24 Sep, all functional areas, with the exception of Treatment and Medical Logistics, were green. Preventive Medicine became green on 23 Sep after potable water was restored to Florida City. A comprehensive transition plan (enclosure 2)) to continue the turnover of all aspects of public health has been submitted.

As of this date, four tent cities are in operation. Harris Field (Camp I) in Homestead, had a population of 898 on 15 Sep based on a census conducted by the Marine Corps. Arthur Twining Davis Park (Camp II) in Florida City has approximately 700 inhabitants. Two other tent cities are under the control of the Army; Camp III, near the Campbell Middle School and Camp IV at the Homestead Middle School. Approximately 290 and 400 persons are housed at each of these facilities. The camps created later have profited by the lessons learned in the early days of the operation. Camp III, for example, has been sited well away from urban areas and is relatively spared the glut of sightseers and press. It is completely fenced in and has paved roads. It is the only camp to have its own government, this moreover, was insisted upon by the inhabitants.

As an intermediate solution to housing the victims, FEMA has procured approximately 900 camper-type trailers. A number of these have already been set up in Camp II (a former trailer park) for occupancy.

Routine medical care for camp inhabitants is provided at the Battalion Aid Stations. Camp I is the most complete with a ward, x-ray and basic laboratory capability. Persons with significant health problems are transferred to one of a number of local hospitals now back in operation. Several DMATs have rotated through the area providing emergency care. Other acute health care services are scattered throughout the disaster area. However, it is estimated that up to 25% of visits to health care facilities are by non-disaster victims taking advantage of free medical care.

Transfer of health care delivery in the camps from the military to HRS and the Public Health Service is imminent. Double-wide trailers have been moved into Camps I and II to replace the BAS's. They will be staffed and equipped in the near future.

SPECIFIC AREAS:

Potable Water

Potable water was restored initially in the Homestead area but a boil water notice remained in effect for Florida City until 23 Sep. Water from Florida City is obtained from four wells, three of which had been positive for total coliforms. Given the shallow water table, however, this is not an unexpected occurrence. Chlorination occurs in underground contact chambers after which the water is pumped into a tower to create pressure. Following the hurricane, the hatch to this tower was noted to be open. Whether this was due to the storm or was a pre-existing condition is unknown. Inspection efforts were hampered because the ladder up to catwalk had been blown away. A contractor raised an inspector by crane to the catwalk located approximately 120 feet above the ground. He verified that the vent screen was in place and performed an underwater visual inspection which revealed no obvious contamination by dead birds, debris etc..

Two rounds of water sampling at 14 points in the distribution system were conducted. After the second round of bacteriological testing remained negative the boil water notice in Florida City was lifted.

A comprehensive bottled water sampling program revealed a widespread problem with the potability of bottled water supplies. Samples from over 20 brands were found to be positive for bacterial contamination. The problem appeared to be related to stocks of bottled water stored in the open or covered with plastic or canvas tarps for long periods of time. To date, no illnesses have been traced to consumption of bottled water. A recommendation was made that bottled water stored in the open for more than a week should be used for non-potable purposes, or preferably discarded.

A total of 90 of the 106 non-community public water systems in the hurricane damage area have been assessed. Bacteriological sample results and a report of the general condition of these systems is pending.

Food Sanitation

Initially, food supply was a problem in the disaster area. Food sanitation programs were not initiated until two weeks after the storm.

Food in the camps is mainly prepared in Mobile Kitchen Trailers (MKTs). Although mess tents have been erected, food is often taken back to individual tents. Unauthorized cooking in the camps on hot plates or barbecue grills is common. An additional problem is created by the presence of outside food vendors who are routinely allowed into the camps. All of these factors have contributed to the accumulation of food and utensil debris.

The turnover of food service duties is underway. Nineteen local civilians were hired to work as food service personnel at Camp I. They received physical examinations and training in proper

handwashing and other safe food handling practices.

Because of the high prevalence of PPD positivity in the area, tuberculin skin testing was also carried out. Five of the employees gave a history of tuberculin reactivity in the past, and were not tested. Of the remaining 14, eight returned for interpretation of their tests. Two of the eight (25%), were positive with induration of 22 mm. and 12 mm. All of the old and new tuberculin reactors identified in this group were referred to HRS for appropriate follow-up or INH chemoprophylaxis.

Inspection of damaged food in community retail and wholesale food outlets resulted in the destruction of over one million pounds of food.

Sanitation

Community sewage systems fared exceptionally well during the storm without a major disruption in service. Porta-Potties were supplied to the camps. Although sufficient numbers were available for the population, emptying and cleaning of the toilets by the city was often inadequate. Removal and hoarding of toilet paper was common until supplies became plentiful.

As was experienced in the Haitian relief effort in Guantanamo Bay, Cuba, a practice of using the showers for defecation and disposal of items such as sanitary napkins and diapers was noted. This has necessitated cleaning by USMC personnel between each shower period.

A specific sanitation issue concerned two YMCA day care tents maintained in Camp I which were consistently filthy and cluttered with food debris, clothing and toys. A strong recommendation for their correction or closure was made by preventive medicine.

Solid Waste

This will be a major long-term issue. Responsibility for collection and disposal of hurricane debris is under the Army Corps of Engineers and Dade County. An estimated 25-30 million cubic yards of solid waste was created by the hurricane. Clearing roads and right-of ways was the first priority. This is estimated to require the removal of 5-7 million cubic yards of debris. The amount of waste to be collected would easily overwhelm the capacity of the existing landfill in the local vicinity. Permits for 74 burn sites have been issued with approximately 20 in current operation. Closer attention is being directed to separating material before burning. More efficient burning through the use of air curtains as well as chipping and mulching has been proposed. Testing of the ash and air and soil sampling should begin soon. Felonious dumping of trash in vacant fields is becoming a problem.

In the camps, solid waste disposal was one of the final preventive medicine issue to be resolved. At present, the number of dumpsters and the emptying schedule are more than adequate for the camp population.

Vector Control (A detailed After-Action Report will be submitted by DVECC JAX)

The important mosquito species in the area were Culex nigripalpus and Aedes taeniarhynchus. Although these are primarily pest mosquitoes, Cx. nigripalpus is a vector of St. Louis encephalitis (SLE). Two occurrences if SLE were recorded in south Florida in 1990. Results from arbovirus surveillance during August, 1992 indicated that SLE activity was negligible statewide.

Significant increases in mosquito populations surprisingly did not occur, however damaged living facilities after the storm allowed more opportunities for exposure.

Aerial spraying was carried out initially by Lee County personnel. Later, three nighttime sprayings with DIBROM(R) were conducted by the Air Force, covering an estimated 150,000 acres. Other measures included hand-held and truck mounted ULV spraying. Ongoing surveillance indicated that these measures were very effective in controlling the mosquito population.

The major pest problems in the camps were green bottle flies and fire ants. Rodent sightings have been minimal and usually occurred when piles of accumulated debris have been disturbed. A baited "buffer zone" was established in the demolished trailer park south of Camp I. In addition, illumination and high levels of foot traffic appear to offset the attraction offered to rodents by food and debris in the camps.

Safety and Health Issues

Camp I was improperly located adjacent to a busy street in downtown Homestead. Vehicle traffic in and out of the camp is very heavy causing physical deterioration of the campsite as well as posing a safety hazard.

Occupants of the camps have voiced fears of gang activity and threats to their personal safety. Although all inhabitants are required to register with the Red Cross there is free movement in and out of the camps. In particular, the north end of Camp I is ill-lit and it is evident that the low fence in that area is crossed at will. PMTs have found syringes (some with needles) just outside the camp line.

Electrical safety has become a major issue. Unauthorized electrical appliances in tents, and dangerous rewiring are commonplace. An electrical inspection found violations in 55 of 108 tents inspected. On 22 Sep, an overloaded rewired circuit set the wire's insulation on fire. There is also fear that with the restoration of power in the community, electrocutions may increase among homeowners effecting repairs.

A second fire occurred in the galley tent at Harris Field. The fire began in a hot pan containing about three inches of grease which was to be used for frying chicken for the noon meal. Although manageable at first, the grease splattered when CO_2 and Halon fire extinguishers were directed toward it. One wall of the canvas galley tent was partially burned before the fire was put

out. One person suffered a minor burn. There were no inhalational injuries. There was no fire alarm in the tent and the high ambient noise level in the area made the situation difficult to relate by word of mouth.

As was mentioned in the section on food sanitation, food preparation the tents poses an additional fire hazard.

Mental Health

The local HRS Mental Health providers have been canvassing the disaster area. Features of Post-Traumatic Stress Disorder such as nightmares and appetite and sleep disturbance are fairly common. No suicides or frank psychotic episodes have been reported.

Local resources have been augmented during the past week by SPRINT (Special Psychological Rapid Intervention Team) from Portsmouth Naval Hospital. This team consists of a psychiatrist, psychologist, two chaplains, a psychiatric nurse and three psychiatric technicians. They are equipped with a Mobile Crisis Units complete with medications to manage psychiatric emergencies. The team has been averaging 2-3 calls per day during their deployment, most minor. Two persons have been involuntarily detained under the Baker Act, (evidencing bizarre behavior or posing a threat to themselves or others). The Myers' Act similarly allows detention because of alcoholic intoxication but has not yet been invoked.

Based on the experience of Hurricane Hugo mild dysphoria and low-grade depression may be expected in the longer term. Adding to this may be a feeling of abandonment as the military presence declines. Also, crisis calls increased by 2-300% in the first few months after the Hurricane Hugo disaster.

Medical Surveillance

The exact number of persons remaining in the disaster area and their demographic breakdown is not known. The figure of 283,000 mentioned in the introduction is an estimation derived from the number of children attending the first day of school as compared to previous years. A census in June 1992 assessed school-age children as comprising 15% of the total population. Attendance data on the first two school days (14-15 Sep) of 1992 was collected. Adjusting for the estimated number of no-shows, (assumed to be the same percentage as in 1991) the school-age fraction was used to estimate the overall population. This was calculated to be 283,000 or 71% of the population present prior to the storm. The Dade County Planning Commission estimated that 39,000 housing units were lost due to the hurricane. Assuming an average of three persons per household this amounts to 117,000 persons being rendered homeless, again leaving a remainder of 283,000. The demographic makeup of these persons has not been well characterized.

Sex, age and other demographic data have been collected for the camps (enclosure (3)) but the camp populations are not representative of the general public since there has been an influx

of young single males seeking work, homeless persons and other non-indigenous groups.

A sex and age breakdown of 1601 individuals admitted to Harris Field is shown below. The sample includes all persons who were admitted to the camp through the Red Cross as of 20 Sep. As seen, young males predominate.

However, the attached graph (enclosure (4)) also shows a distinctly bimodal age distribution.

SEX	Freq	Percent
F	495	30.9%
M	1106	69.1%
Total	1601	100.0%

AGE	
Range	1 Mo. - 88 Yrs.
Mean	28 Yrs.

Age Distribution by 10 Year Intervals by Sex

	Freq	Percent	Cum.	Freq	Percent	Cum.
0 TO	184	16.6%	16.6%	135	27.3%	27.3%
10 TO	133	12.0%	28.7%	99	20.0%	47.3%
20 TO	223	20.2%	48.8%	96	19.4%	66.7%
30 TO	286	25.9%	74.7%	89	18.0%	84.6%
40 TO	172	15.6%	90.2%	43	8.7%	93.3%
50 TO	65	5.9%	96.1%	14	2.8%	96.2%
60 TO	30	2.7%	98.8%	9	1.8%	98.0%
70 TO	10	0.9%	99.7%	5	1.0%	99.0%
80 TO	3	0.3%	100.0%	5	1.0%	100.0%
Total	1106	100.0%		495	100.0%	

The sex and age distribution of Camp II (Arthur Vining Davis Park) was essentially identical.

A passive surveillance system collects daily medical log entries from all the camps and (at the time of this writing) approximately 20 other health care delivery sites (see enclosure (5)). This system is augmented In Camps I and II by daily walk-throughs performed by HRS nurses. As of 22 Sep, a total of 10,234 Task Force personnel and 64,947 civilian visits had been logged by the treatment facilities under surveillance.

Minor injuries such as lacerations and puncture wounds have been the major health problem noted from the surveillance. Treatment of these injuries has commonly required immunization against tetanus. Proportionally, they have accounted for 20 to 44% of all visits by non-military personnel. In comparison, the proportion of daily visits accounted for by respiratory and gastrointestinal complaints have both ranged from 3-7%.

Although no frank outbreaks have occurred a few threats of communicable disease clusters have required investigation.

During the week of 06 Sep an increase in diarrheal disease was noted at Harris Field. Of the 33 cases identified, 15 (45%) were under 5 years of age. A brief survey of 64 residents from 12 randomly selected tents was conducted. Five (7.8%) individuals reported diarrhea in the 72 hours prior to the interview. None of the cases had sought help. There was no association with the local day care center although deficient hand washing facilities were identified.

On 05 Sep the Task Force DFO (Disaster Field Office) clinic at the Eastern Airlines terminal in the Miami airport reported that a large proportion of their visits were for respiratory complaints. Industrial hygiene sampling and an informal symptom survey indicated that a "sick building" type condition existed. Contributing factors were overcrowding, smoking, the presence of mold, mildew, dust and debris (e.g. broken ceiling tiles). An examination of the large air handlers revealed standing water and blocked filters. An overall clean-up and ventilation was undertaken.

On 22 Sep a cluster of rash illness was reported in personnel from the 82nd Airborne Division. The assessment by the dermatology team from the University of Miami was that the lesions were secondary to bites from culicoides spp.. Most individuals reported little or no use of DEET containing insect repellant.

Sporadic cases of chickenpox were also noted. Two were imported from a CONUS-based Army unit in which an outbreak was occurring. Clinical diagnoses of individual cases of measles and scarlet fever were reported, but again, no propagation of disease was apparent. Nonetheless, in addition to routine immunization of school-age children a measles vaccination campaign involving all four camps began on 21 Sep, 1992.

Concern was also expressed by representatives of the State Tuberculosis Control Program of possible TB transmission in the camps. According to the project coordinator over half of 40 confirmed cases under treatment had been lost to follow-up. Interrupted treatment increases the possibility of development of multi-drug resistant TB. Red Cross camp registration records (enclosure (3)) were reviewed for possible matches.

Conclusions:

Although the task force operation was a confirmed success by most measures, there are a number of lessons to be learned.

It is an apparent inevitability following disasters of this nature that the existing chaos will be amplified by uncontrolled outpourings of aid. Usually, the unplanned arrival of individuals offering services can be absorbed. Supplies pose a greater problem. For example, a major task facing the pharmacy group was dealing with the large amounts of unsolicited (and often unusable) medications sent to the area. Amazingly, these were often individual prescriptions bearing a patient's name. Widespread littering with clothing articles resulted when distribution sites became too numerous to be tended. The number and diversity of ad

hoc sites in some cases interfered with official efforts to organize relief efforts. An unfortunate concomitant of these laudable but short-term assistance efforts was the confusion to the public which resulted from their sudden appearance and disappearance.

Effective administration of the tent cities (later re-named "Life Support Centers") by military forces was hampered by unresolved Command and Control issues. The basic obstacle concerned the Posse Comitatus Act which prohibits federal forces from being used to enforce civilian laws if martial law has not been established. Although the presence of military in uniform had a stabilizing influence overall, no sanctions existed for infractions of individual camp rules. Since the camps operated on city property it seems reasonable that they would be subject to local codes and ordinances but this option was not vigorously used. As a result, safety and health violations as previously described were an ongoing problem. And although the absence of any extensive food or waterborne disease testifies to the effectiveness of existing public health measures, they were consistently felt to be slightly short of optimum. Requiring military to perform camp maintenance duties rightly the responsibility of the camp inhabitants, lowered morale and strained relations between the victims and their benefactors. Coordination among the respective Task Force elements was in general good. However, it would have been facilitated by an organizational design less cumbersome than the parallel Army and PHS structure that was adopted.

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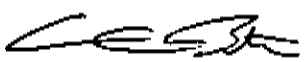

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